

palæozoic schist in Quebec, are included among the beliefs which have been accepted and then given up by scientific men. Having thus discredited their judgment, he proceeds to contradict himself as to the conclusions of Evans, Lubbock, and Lyell with regard to the division of time past, before the dawn of history, into the stages of rude stone, polished stone, bronze, and iron. A large portion of the book, the entire argument, so far as we can make it out, is devoted to proving that these stages were simultaneous, and not older than the six or eight thousand years of history and tradition. In p. 400 he allows that they are consecutive almost as distinctly as Mr. Evans.

In proving that "the ages" are simultaneous he adopts the same kind of reasoning as that by which Mr. Ferguson arrives at the post-Roman age of the Megalithic monuments, and Mr. Wright concludes that the Britons during the time of the Roman invasion used bronze swords. It is a very simple process. You find a certain set of things in a cave, in a cairn, or a tumulus, or in diggings near a Roman station, and you at once conclude that they were used at the same time by the same people. In every one of the cases cited there is no proof that the deposit in which the articles occur has not been disturbed. Before any association of the kind quoted is of the least value we must be certain that there has been no subsequent disturbance; such proof, for example, as we get in some of the pile-dwellings of Switzerland; such proof as we do not get at Solutr , where a Mero-vigian cemetery happened to be planted on an old "station" of the Pal olithic age, as the writer of this review was informed by Dr. Broca at the French Association at Lyons in 1873. In this case, which is made the basis of the attack on the high antiquity of Pal olithic man, the human skulls are comparatively modern, and the refuse heap of an untold age.

We have followed Mr. Southall into a labyrinth, and we have been unable to find a single shred of proof of the recent origin of man. We lay down his book with regret that he should have expended so much labour, with the practical result of leading the unwary reader into errors as to facts—for example, that Busk stated the Cave-bear to be identical with the Grizzly, or that Brandt believes that the Irish Elk lived in Central Europe down to the fourteenth century, two cases which occur to us. We trust that few Americans will take the views ascribed to the leading archaeologists of Europe, in this handsome and well-printed book, without verification by an appeal to their writings.

W. B. D.

OUR BOOK SHELF

The Indian Alps, and how we crossed them; being a Narrative of Two Years' Residence in the Eastern Himalayas and Two Months' Tour into the Interior. By a Lady Pioneer. Illustrated by herself. (London: Longmans and Co., 1876.)

THE plucky authoress of this handsome work makes no pretensions to give any scientific account of that portion of the Himalayas into which she penetrated; this, however, is the less to be regretted as, from a scientific point of view, much of the ground over which she passed has been rendered classic by Dr. Hooker. Her starting-point was Darjeeling, and the first portion of the work describes a pleasant preliminary trip which she and her husband made to the east as far as Dumsong. On returning from

this outing, she, her husband F., and a friend C., accompanied by a small army of attendants, set out to penetrate, and if possible cross, the Eastern Himalayas. Their route was westwards by Mount Tongloo, and then almost directly northwards by Mount Singaleelah, the Dumsongla Pass, and onwards as far as the base of Mount Junnoo. The party took a large quantity of provisions with them, but depended upon a chief in the interior to supplement this supply about half-way. The chief failed them, and a guide whom they picked up on their route, after leading them all astray into a most inhospitable region, decamped, leaving them in a most perilous position. Happily, after much murmuring and danger of mutiny on the part of their attendants, they managed to extricate themselves without any loss or serious damage to anyone. Returning by the same route as far as Mount Singaleelah, the venturesome tourists turned eastwards and then southwards, along the Great Rungeet River, and so back again to Darjeeling, after a journey which, notwithstanding a few hardships, all seem to have enjoyed immensely. Although there is no formal attempt to describe either the fauna, flora, or geology of the region passed through, the authoress's descriptions are so minute, and her references to the characteristic animal and plant life of the various stages so frequent, that the reader will have a fair notion of the general features of the line of march. The Lady Pioneer's artistic attainments are of a high order, and her sympathy with nature from this point of view intense; her descriptions are, moreover, so clear and intelligible, and the illustrations are so numerous and well executed, that the book from beginning to end is a delight. A marked feature of the work is the chromolithographs, creditable alike to the artist and printer, affording better than any verbal description an idea of the character of the unequalled Himalayan scenery. The invariable sweetness of the author's style, and we may say of her temper under all circumstances, and her strong sense of humour, add to the charm of her narrative. The reader may learn a great deal from her book about the country passed through and about the various classes and tribes of people she met and mixed freely with, for she is a shrewd observer of men and manners. One cannot help thinking, we may venture to say, that F., whom she dutifully brings to the front on almost every page, is a lucky fellow. As might be expected, there is a good deal of moralising under the awful influences of the "Abode of Snow;" perhaps too much of it, though this natural failing will be overlooked, considering the genuine attractions which the work possesses.

Quite recently we reviewed Mr. Wilson's delightful work the "Abode of Snow," describing a journey which he made through the Western Himalayas; that, along with the present work, is very suggestive of the development of English ideas at least with regard to that class of scenery to which the term "grand" is usually applied.

It is well known that the tourist fever is of quite modern origin. It is only within the present century that an appreciation of wild and mountainous scenery has become anything like general. It would be difficult to find much in the way of admiration for such scenery in any poet who wrote before Wordsworth and Scott; an intelligent and well-educated officer of Engineers who lived in the midst of some of the now most admired Highland scenery in the early part of last century, wrote of it with something like horror; he could see "no beauty in it that it should be desired." While in this country the two poets above mentioned have no doubt had a principal share in originating the modern taste, there are other causes, connected with the general advance in intelligence and elevation of taste, which it would be instructive to trace. We are inclined to believe that the very modern science of geology has something to do with it; and certainly he who has a fair knowledge of the facts and principles of that science, not to mention the other natural

sciences, will be able to read infinitely grander legends in wild and mountainous scenery than he who looks upon it alone through the glamour thrown over it by mythology or genius. At all events, we welcome the spreading love of travel as one of many signs of a great intellectual awakening, although doubtless at present it has a good deal about it which lays it open to the sneer of the cynic, as have all new movements. There is a considerable, and we think ill-natured outcry in certain quarters, that all the accessible tourist grounds will become more and more crowded by the followers of the beneficent Cook. But there will always be some spot to which he who does not wish to be counted one of the common herd of tourists can retreat until he has gained vigour and nerve enough to feel in a mood to mix again with "the kindly race of men." Such a retreat is, and will for long be afforded by the "Abode of Snow" which Mr. Wilson and this Lady Pioneer have so attractively described; by and by, no doubt, it will be made more accessible by roads either from our own or from the other (is it premature to say the Russian?) side.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

The Article "Birds" in "Encyclopædia Britannica"

MR. GARROD'S article on the new edition of the "Encyclopædia Britannica" in last week's NATURE contains the following passage:—

"As another example of the different teaching of the artificial and the natural classifications, the Swifts (*Cypselidae*) and the Hummingbirds (*Trochilidae*) may be referred to. Thesetwogroups, from the details of their internal structure when examined one by one, are most certainly related as intimately as are the Woodpeckers with the Toucans. There is, in fact, not a family difference between them, and yet, from their palates, Professors Huxley and Parker place them in quite different divisions, because the vomer is truncated in the one and pointed in the other."

In a previous part of the article Mr. Garrod refers to my paper on the Classification of Birds, published in the Proceedings of the Zoological Society in 1867, which he criticises as if he had studied it with a care proportioned to the labour it cost. Nevertheless, I can but think that his acquaintance with its contents must be somewhat superficial, inasmuch as any careful reader will find at p. 459, the following passage under the head of *Cypselomorpha*, or Swift-like birds:—

"This group contains three very distinct families—the *Trochilidae*, the *Cypselidae*, and the *Caprimulgidae*. The first two families have a length of the manus and a brevity of the humerus which is peculiar to themselves."

Thus, so far from placing the Swifts and the Hummingbirds in "quite different divisions," I placed them in the same division, and took pains to point out their close affinity; and in asserting the intimate relations of the *Cypselidae* and *Trochilidae*, Mr. Garrod is reiterating a view which, unless I mistake, was first definitely put forward by myself, and not, as the readers of his article would be led to imagine, controverting my opinions.

Mr. Garrod takes pains to show that "the structure of the skull does not alone suffice to determine the mutual affinities of birds." The implication appears to be that Mr. Parker and I assert the contrary. I have no right to speak for Mr. Parker, but I may remark that my knowledge of his works would not have led me to Mr. Garrod's conclusion, while it would have compelled me to treat any opinion of his, however much I might be disposed to differ from it, in a manner different from that adopted by Mr. Garrod. As to the facts, so far as I am concerned, those who will take the trouble to read my paper on the Classification of Birds, and an article by the editor of the *Ibis*, with a letter addressed to him by me, published in the *Ibis* for 1868, will see that the classification in question is not based upon cranial structure alone, and that, seven years ago, we went a little deeper into the question of the principles to

be followed in taxonomy than the point at present attained by Mr. Garrod.

Jan. 23

T. H. HUXLEY

D-Line Spectra

IN reply to a question propounded to you by a correspondent (vol. xiii. p. 224) as to my reasons for believing that sodium is free in the flame of a spirit-lamp with salted wick, I have to state as follows:—

1. We now know that the flame exercises a specific absorption, and is capable of producing dark D. If this were due to vapour of chloride of sodium, we should expect, in accordance with what observation shows in other cases, that solution of chloride of sodium, or at least the solid chloride, would more or less absorb the orange or yellow part of the spectrum, though not in the same definite way, and we find it does not.

2. We know, by direct experiment, that vapour of sodium does exert the very peculiar absorption indicated by dark D. Different salts of the same metallic oxide agree in the mode in which their solutions absorb light, or at least there is a strong family likeness; but when we pass from one oxide to another of the same metal, there is a complete change. Much more should we expect a complete change when there is such a profound difference of chemical character as there is between sodium itself and chloride of sodium.

3. Lastly, Mr. A. Mitcherlich has proved, by direct experiment, that vapour of chloride of sodium within a tube heated to bright redness neither emits bright D nor produces dark D by absorption (*Poggendorff's Annalen*, vol. 116, pp. 504, 505).

It need not surprise us that sodium should be temporarily free in an ordinary flame, since the metal is prepared by heating carbonate of soda with charcoal, and in the flame we have hydrocarbons at a high temperature. Perhaps the heat alone would suffice to set it free by dissociation.

G. G. STOKES

Cambridge

The True Nature of Lichens

THE editorial note on this subject in NATURE, vol. xiii. p. 168, was thoroughly disappointing to those who, like myself, may have had hopes that the confident allusion by the reviewer of Haeckel to the "clearing up" of the "true nature of Lichens" had reference to some demonstration—of which we had not heard—of the part played by *Spermogonia* and *Pycnidia* in *Lichen-Reproduction*. Having long had in contemplation the publication of a volume of "Outlines of Lichenology," it has been my business for years to note carefully all publications of any importance on the Natural History of Lichens. Those of Prof. Schwendener of Bâle and his disciples could scarcely have escaped me; so that I find the papers mentioned in the editorial note aforesaid, as well as others, duly recorded, with abstracts and relative criticisms, in my Lichenological memorandum book.

My opinion of the speculations of Schwendener and his followers has all along been, and still is, that so far from "clearing up" the "true nature of Lichens," they introduce elements of very decided confusion; and that they are to be regarded merely as illustrations of German transcendentalism, comparable to the fanciful notions of his countryman Bayrhafer, in 1851, concerning Lichen-Reproduction.* The dogmatic assertions of anonymous critics concerning the "clearing up" of the "true nature of Lichens" by mere Speculations notwithstanding—I hold what I have always held—that the Lichens as an Order are quite as natural, important, and distinct as any other Order of the Cryptogamia. And in so saying I do not forget the fact that they overlap both the *Algæ* and the *Fungi*. On the contrary, I have over and over again pointed out, in my own publications on the Natural History of Lichens, the affinities, or points of affinity, between Lichens, and Algæ on the one hand, Fungi on the other. In order that sight might not be lost of organisms of doubtful character, possessing elements of structure usually regarded as both algaoid and lichenoid, or fungoid and lichenoid, or either the one or the other, I long since proposed the establishment of *intermediate and provisional groups of Algo-lichenes and Fungo-lichenes*. Such groups would have the advantage of attracting attention to those *passage-forms*, which appear to me to be of the highest interest to the philosophical botanist.

I have not myself had an opportunity of perusing Haeckel's

* "Einiges über Lichenen und deren Befruchtung," von J. D. W. Bayrhafer, Bern, 1851; an illustrated 4to.